INCIDENTAL CATCH OF KEMP'S RIDLEY SEA TURTLES (*Lepidochelys kempi*), BY HOOK AND LINE, ALONG THE TEXAS COAST, 1980 - 1992

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Kemp's ridley sea turtles (*Lepidochelys kempi*) have been reported as by-catch in a variety of marine fisheries, both commercial and recreational (Manzella et al., 1988, Fontaine et al., 1989, and Magnuson et al., 1990). This paper focuses on reports of Kemp's ridleys caught or snagged by hook and line along the Texas coast during 1980 - 1992. Emphasis is placed on the upper Texas coast during 1992, for which an unusually high number of hook and line captures of Kemp's ridleys was reported.

METHODS

Data sources included the Sea Turtle Stranding and Salvage Network (STSSN) data base maintained at the NMFS Southeast Fisheries Science Center's (SEFSC) Miami Laboratory, Miami, FL, and data bases maintained by the NMFS SEFSC Galveston Laboratory. The combined data included wild and head started Kemp's ridleys, both live and dead, for 1980-1992. Information on Kemp's ridleys included call-in reports from the general public, various local, state and federal agencies, X-rays by veterinarians, and necropsies performed by veterinarians, Texas A&M University, and STSSN participants, either in the field or in the laboratory.

Data were grouped into two geographical zones along the Texas coast, herein referred to as the Upper Texas Coast (UTC) and the rest of the coast (Rest). The boundary between the UTC and the Rest was set between Bolivar Peninsula and Galveston Island, at latitude 29° 20' N and longitude 94° 45' W. The UTC was defined as the coastline from this boundary north and east to Sabine Pass, and the Rest as southward to the Texas-Mexico border.

Curved carapace length (CCL, in cm), was the length most often reported, so it was used in our analyses of size distributions. When only the straight carapace length (SCL) was reported, the following conversion equation was used to obtain SCL from CCL (Manzella and Williams, 1992), CCL = 1.06 x SCL.

Records were grouped into 10 cm CCL class intervals, with the largest turtles assigned to the >50.0 cm size class. Only one report of a Kemp's ridley associated with hook and line was for a turtle with CCL < 20.1 cm. It was hooked in the eye near Port Aransas, TX. Therefore, only turtles with CCL 20.1 cm or larger were included in analyses of size distributions, comparing hook and line vs other reports. All statistical analyses were conducted on frequencies of reports, using chi-square. The critical region of rejection of the null hypothesis (of independence) was at $\alpha = 0.05$.

RESULTS

From 1980 through 1992, 1,471 Kemp's ridley sea turtles were reported along the Texas coast. Of these, 118 (8%) were associated with hook and line, and 39 (33%) of these were reported during 1992. Of the 39, 30 (77%) were from the UTC.

Of the 118 hook and line associated Kemp's ridley reports, 101 (86%) indicated that the turtles were usually unharmed and released alive, upon removal of the hook by the fisherman. However, 11 (9%), though alive, were held for veterinary care, and 6 (5%) were found stranded dead (fish hooks were discovered by necropsy). One wild Kemp's ridley was taken to a veterinarian who removed a hook from the left side of the mouth, but an X-ray detected two more hooks in its esophagus, all hooks were removed and the turtle was later released with a satellite tag.

When all years were combined, the proportion of hook and line associated reports was significantly dependent on the zone in which the turtles were reported. More, 62 (52.5%), were reported from UTC than the Rest, 56 (47.5%). When 1992 was omitted, the proportion of hook and line associated reports was independent of zone, suggesting that 1992 was an unusual year for hook and line captures of Kemp's ridleys along the UTC. Also, the proportion of hook and line associated reports was higher for UTC during 1992 (47%) than for all previous years (8%).

By zone, the proportion of reports associated with hook and line vs other reports was dependent on type of turtle (head started vs wild). Hook and line related reports had a significantly higher proportion of head started turtles (69% for UTC, 56% for Rest) than did other reports (20% for UTC, 40% for Rest). All head started turtles reported as being associated with hook and line had been in the wild for at least one year, a period we consider more than adequate for their adaptation to the wild. We do not believe a head started Kemp's ridley could survive a year in the wild without such adaptation.

The proportion of Kemp's ridleys associated with hook and line was dependent on size, both for wild and head started turtles, when all years were combined. The size class most often associated with hook and line was 30.1-40.0 cm. Size distributions were similar for head started and wild Kemp's ridleys caught on hook and line.

DISCUSSION AND CONCLUSION

Most Kemp's ridleys, both wild and head started, associated with hook and line were 30.1-40.0 cm CCL. Presence of this size class of turtles, especially in shallow waters of the UTC, may reflect opportunistic feeding. Shaver (1991) indicated that only Kemp's ridleys with a CCL 20-60 cm contained fish or shrimp, although she believed that the fish were probably dead at time of ingestion and shrimp trawl by-catch related. The preferred baits used by surf fishermen on the UTC are cut mullet (*Mugil* spp.) and shrimp (*Penaeus* spp.). These also are naturally abundant species on the UTC. Such baits may be particularly attractive to Kemp's ridleys 30.1-40.0 cm in CCL, thus increasing their vulnerability to capture on hook and line.

The reason for the increased number of Kemp's ridleys associated with hook and line along UTC is not known. It may reflect an increase in Kemp's ridleys as a result of their protection through use of turtle excluder devices (TEDs) by commercial shrimpers. Also, in 1992, many bays south of Galveston had low salinities (e.g., 0-4 ppt in Matagorda Bay; Britt Bumgardner, Texas Parks & Wildlife Department, personal communication July 1992). Such low salinities may have forced crabs and other prey out of the bays and shallow coastal waters offshore. This may have increased the concentration of food for turtles on the UTC in 1992. The UTC may have represented prime feeding habitat for Kemp's ridleys in 1992.

For all years combined, the proportion of head started turtles associated with hook and line (63%) was higher than that of wild Kemp's ridleys (37%). Because all head started Kemp's ridleys are tagged (Fontaine

et al. 1989), we believe they are more likely to be reported than untagged wild ridleys (see also Eckert et al. 1992). Regardless, our analyses suggest that both wild and head started Kemp's ridleys are vulnerable to capture by hook and line, and the impact of this type of capture may be underestimated by the available data bases. It is possible that some live Kemp's ridleys released after capture by hook and line may suffer from ill effects of hooks lodged in the esophagus or stomach.

LITERATURE CITED

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